MICHIGAN STATE NORMAL COLLEGE
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AN INVESTIGATION ON THE VALUE OF DRILL WORK IN THE FUNDAMENTAL OPERATIONS OF ARITHMETIC.

PART I.

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In the issue of THE JOURNAL OF EDUCATIONAL PSYCHOLOGY for February, 1911, the writer reported the results of an investigation upon the above topic. The investigation was conducted at the Eastern Illinois State Normal School and included the pupils of the sixth, seventh and eighth grades in the practice school. The total number of pupils examined was 51,—18 boys and 33 girls.

The effects of the drill in fundamentals were shown by a comparison of sections subjected to the drill with sections of equal size and approximately equal ability not subjected to the drill, but otherwise undergoing the same arithmetic instruction. The effects of the drill were most marked in the sixth grade and least in the eighth, although the results were significant in all three grades. The improvement caused by the drill was very apparent after the lapse of the 12 weeks' summer vacation.

The results of the investigation were of so positive a nature that the writer decided to extend it to the sixth grades of several school systems in order to secure additional data relative to the value of brief drill periods in arithmetic. The tests given in the school systems were identical in every respect with those given in the first investigation, details of which will

be found in the issue of February, 1911. After giving a summary of the results of the first investigation the results of the second study will be stated.

In the first investigation the drill section had been given five minutes' drill daily for 30 recitation periods, and the non-drill class had had no drill. In all of the summaries that follow "I" indicates the combined drill section and "II" the combined non-drill section.

Summary of Results of First Investigation.

A Comparison of the Results of the First and Second Tests.

I did 21.2 per cent. better on second test than on first in number of problems worked.
II did 9.8 per cent. better on second test than on first in number of problems worked.
I did 33.4 per cent. better on second test than on first in addition.
II did 11.8 per cent. better on second test than on first in addition.
I did 36.9 per cent. better on second test than on first in subtraction.
II did 13.1 per cent. better on second test than on first in subtraction.
I did 30. per cent. better on second test than on first in multiplication.
II did 13.7 per cent. better on second test than on first in multiplication.
I did 28. per cent. better on second test than on first in division.
II did 19.3 per cent. better on second test than on first in division.
I did 32. per cent. better on second test than on first in total number points made.
II did 14.7 per cent. better on second test than on first in total number points made.
I did 5.8 per cent. better on second test than on first on first six problems.
II did 2.4 per cent. poorer on second test than on first on first six problems.

The number of problems worked in each test may be taken as a measure of the speed of the pupils. It is seen that the drill section increased its speed by a much larger per cent. than the non-drill section.

The drill section of the sixth grade made the greatest increase in speed, 35 per cent. The seventh grade drill section made a gain of 20 per cent., and the eighth grade of 13.8 per cent. in speed.

Since all of the pupils of all of the sections worked at least the first six problems, a comparison of the number of points scored on these problems affords a fair measure of the effect of the drill upon accuracy in the fundamental operations. The accuracy of the drill class, measured in this way, increased 5.8 per cent., while that of the non-drill class decreased 2.4 per cent.

The drill section of the sixth grade also made the greatest improvement upon its own record on the total number of points scored, a gain of 52.3 per cent. The seventh grade drill section made a gain of 33.5 per cent., and the eighth a gain of 19.5 per cent. The drill exercise proved about equally valuable to both boys and girls.

In the following table the first test was given before the drill was begun, the second test was given immediately after the 30 days' drill, and the third test was given on the first day of the fall term, after a vacation of 12 weeks:

A Comparison of the Results of the Third Test with the First and Second.

("I" indicates combined drill sections. "II" the non-drill sections.)

I did 26.4 per cent. better than on first test and 4.1 per cent. better than on second test in number of problems worked.
II did 9.8 per cent. better than on first test and same as on second test in number of problems worked.
I did 25.4 per cent. better than on first test and 6 per cent. poorer than on second test in addition.
II did 7.7 per cent. better than on first test and 3.7 per cent. poorer than on second test in addition.
I did 46.2 per cent. better than on first test and 6.7 per cent. better than on second test in subtraction.
II did 20.4 per cent. better than on first test and 6.4 per cent. better than on second test in subtraction.
I did 31.3 per cent. better than on first test and 1.5 per cent. better than on second test in multiplication.
II did 11.1 per cent. better than on first test and 2.2 per cent. poorer than on second test in multiplication.
I did 36.7 per cent. better than on first test and 7.3 per cent. better than on second test in division.
II did 11.1 per cent. better than on first test and 2.8 per cent. poorer than on second test in division.
I did 31.7 per cent. better than on first test and 0.2 per cent. poorer than on second test in total points.
II did 12.16 per cent. better than on first test and 2.29 per cent. poorer than on second test in total points.
I did 5.2 per cent. better than on first test and 0.6 per cent. poorer than on second test in first six problems.
II did 3.7 per cent. poorer than on first test and 1.3 per cent. poorer than on second test in first six problems.

The results of the third test indicated that the superiority of the drill class was maintained over the vacation period. The "period of hibernation" served to increase the speed, while those who had not had the advantage of the drill worked no faster than on the second test. The non-drill section either made no improvement or did worse than on the second test in everything except subtraction.

Drill increased the median 29.2 per cent. and decreased the variability. The data seemed to indicate that drill work operated to equalize the advantages which the arithmetic lessons afforded to pupils of various abilities in computation.

Second Study.

The tests were given in the sixth grades of three different public- school systems and in the sixth grade of a large private school. The total number of cases recorded in this second study is 222; of these, 110 were boys and 112 were girls. None of the cases reported here is included in the first study.

The three public schools examined are in the Central West. City C has a population of 7000, City M of 12,000, and City D of 30,000. The private school is in New York City.

The conditions under which the tests were given were very similar to those described in the preceding pages. All of the tests were personally conducted by the author. The individual records made on the first test were the basis upon which subsequent attainment was judged. No attempt was made to compare the drill classes directly with the non-drill classes. The object was to determine the improvement made by the drill class upon its previous record and the improvement made by the non-drill class upon its previous record.

In a given class the tests were conducted at the same hour of the school day, in order to eliminate the time factor as far as possible.

This study differs from the preceding study in one important respect. Instead of an interval of 30 recitation periods between the two tests, an interval of only 20 recitation periods occurred between the tests.

Immediately after the first test was given in each school half of the classes examined in each city were given five minutes' drill each day upon the fundamental operations in arithmetic—addition, subtraction, multiplication and division. The first five minutes of the recitation period in arithmetic were devoted to the drill work. The drill was partly oral and partly written, and the time was about evenly distributed among the four operations.

No special instructions were given to the teachers in charge of the drill sections except that they were to emphasize both speed and accuracy in the four operations, and were to cover the same daily assignments in the textbook as the class that had no drill. The teachers of the non-drill classes were asked to give no formal drill upon any of the four fundamental operations during the time that this investigation was in progress. These instructions were carefully observed by the teachers.

The drill classes in each city were able to cover the same subject-matter of the text as the non-drill classes of that city. No special tests were given to determine the comparative excellence of the textbook work, but in every case the teacher in charge of a drill class reported that five minutes devoted to drill work at the beginning of each recitation seemed to act as a mental tonic. It seemed to energize the pupils and to make them keen for the textbook work that was to follow. All teachers of drill classes reported an improvement in textbook work. The writer is not prepared to say whether this improvement was real or imaginary, or, if real, how much of it was directly due to the drill work.

Formal drill work on the four fundamental operations had not been given prior to this investigation in any of the sixth grades examined. Whatever marked changes occurred in all of the drill sections that did not occur in the non-drill sections may reasonably be attributed to the results of the special drill.

This investigation was conducted in the three public-school systems in November and December, 1910, and in the private school in April and May, 1911.

In all of the tables that follow city C will be referred to as C, city M as M, and city D as D. The private school will be referred to as P. The two classes examined in C, in M and in P will be designated as I and II, where I refers to the drill class and II to the non-drill class. In D there were four classes examined. These four classes will be designated as I, II, III, IV. The drill classes in D are I and III; the non-drill classes are II and IV.

All of the tables upon which the following conclusions are based have been placed on file with the department of education of Teachers College.

The age given represents the age to the nearest half-year at the time the first test was given.

A general summary of the results in the combined drill and in the combined non-drill classes will first be given, then a more detailed study of each class and of individual records will be made:

Summary of Complete Data of All Classes Combined—222 Cases.

Summary of Complete Data of All Classes Combined: 222 Cases.

	No. Problems Worked First Test.	Problems Second Test.	Addition First Test.	Addition Second Test.	Subtraction First Test.	Subtraction Second Test.	Multiplication First Test.	Multiplication Second Test.	Division First Test.	Division Second Test.	Totals First Test.	Totals Second Test.	Difference in Totals.	First Six Problems First Test.	First Six Problems Second Test.	Age.
Grand Totals.....	1356	1516	2464	2773	582	713	1899	2236	930	1159	5875	6885	1010	5481	2758	2714
Arith. Average.....	6.14	6.85	11.1	12.06	2.6	3.2	8.55	10.07	4.2	5.2	26.4	31.01	4.55	24.7	25.9	12.2
Per Cent. Gained Av.		11.8		12.7		22.4		17.7		24.6		17.1			5.05	

Summary of Data for Drill and Non-Drill Classes Combined.

Drill Classes Combined: 112 Cases.

	No. Problems Worked First Test.	Problems Second Test.	Addition First Test.	Addition Second Test.	Subtraction First Test.	Subtraction Second Test.	Multiplication First Test.	Multiplication Second Test.	Division First Test.	Division Second Test.	Totals First Test.	Totals Second Test.	Difference in Totals.	First Six Problems First Test.	First Six Problems Second Test.	Age.
Grand Totals.....	690	807	1241	1471	306	404	977	1213	485	651	3009	3739	730	2789	3117	1369
Arith. Average.....	6.1	7.2	11.08	13.1	2.7	3.5	8.7	100.8	4.3	5.8	26.6	33.3	6.5	24.8	27.8	12.2
Per Cent. Gained Av.		16.9		18.5		32.0		24.1		34.2		24.2			11.7	

Non-Drill Classes Combined: 110 Cases.

Grand Totals.....	666	709	1223	1307	276	309	922	1023	440	508	2866	3146	280	2692	2641	1345
Arith. Average.....	6.05	6.4	11.1	11.8	2.5	2.8	8.4	9.3	4.0	4.6	26.1	28.6	2.5	24.5	24.0	12.3
Per Cent. Gained Av.		6.4		6.8		11.9		10.9		15.4		9.4			—1.8	

In the following "I" indicates the drill classes combined and "II" the non-drill classes combined:

I did 16.9 per cent. better on second test than on first in number of problems worked.
II did 6.4 per cent. better on second test than on first in number of problems worked.
I did 18.5 per cent. better on second test than on first in addition.
II did 6.8 per cent. better on second test than on first in addition.
I did 32.0 per cent. better on second test than on first in subtraction.
III did 11.9 per cent. better on second test than on first in subtraction.

I did 24.1 per cent. better on second test than on first in multiplication.
III did 10.9 per cent. better on second test than on first in multiplication.
I did 34.2 per cent. better on second test than on first in division.
II did 15.4 per cent. better on second test than on first in division.
I did 24.2 per cent. better on second test than on first in total number of points.
II did 9.4 per cent. better on second test than on first in total number of points.
I did 11.7 per cent. better on second test than on first in first six problems.
II did —1.8 per cent. better on second test than on first in first six problems.

If the number of problems worked in each test may be taken as a measure of the speed of the pupils, it is seen that the drill class increased its speed by a much larger per cent. than the non-drill class.

Since practically all of the pupils finished at least the first six problems in each test, a comparison of the records made on these six problems will give a basis for determining the relative accuracy. Measured by this standard, the drill class made a gain of 11.7 per cent. in accuracy, whereas the non-drill class actually lost in accuracy (— 1.8 per cent.).

The largest gain made by the drill class was in division, 34.2 per cent., which was more than twice the gain made in division by the non-drill class, 15.4 per cent.

If we compare the gain made by the drill class upon its own record with the gain made by the non-drill class upon its own record, we find that the following results were attained:

I gained 2.64 times as much as II on number of problems worked.
I gained 2.72 times as much as II in addition.
I gained 2.68 times as much as II in subtraction.
I gained 2.21 times as much as II in multiplication.
I gained 3.13 times as much as II in division.
I gained 2.57 times as much as II in total number of points.

The drill classes made from two and one-fifth to three and one-tenth times as much improvement as the non-drill classes. It is worthy of note that the average age in the drill classes was exactly the same as the average age in the non-drill classes, being 12.2 years in each case.

Of the 112 cases in the drill classes, 95 gained in total number of points scored; 5 neither gained nor lost, and 12 lost.

Of the 110 cases in the non-drill classes, 50 gained; 7 neither gained nor lost, and 53 lost.

The largest individual gain made by any pupil in the drill

classes was 46 points. This was made by a pupil with a record of 30 points on the first test. The gain made by this individual over the record of the first test was therefore 253 per cent. The largest gain made by any pupil in the non-drill classes was 19 points. This was made by a pupil with a record of 32 points on the first test. The gain over the record of the first test was 159 per cent.

The average gain in total number of points made by the 95 pupils who gained in the drill classes was 9.8 points, and the median gain was 10 points.

The average gain in total points made by the 50 pupils who gained in the non-drill classes was 5.9 points, and the median gain was 5 points.

The average loss in total number of points made by the 12 pupils who lost in the drill classes was 4.67 points, and the median loss was 4 points.

The average loss in total number of points made by the 53 pupils who lost in the non-drill class was 6.26 points, and the median loss was 6 points.

The greatest loss made by an individual pupil in the drill classes was 13 points, and in the non-drill classes was 17 points. This was a loss of 36 per cent. by the pupil in the drill class and of 54 per cent. by the pupil in the non-drill class.

(To be concluded in the December issue.)

GRADED MENTAL TESTS.

Part III. Judgment, Conclusions and Summary of Results.

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7. Judgment:

The final group of tests was designed to measure ability to reason, beginning with concrete situations and ending with a test which required the formulation of a definition for an abstract idea. These tests, with the exception of the definition test, are all modifications of some that have previously been given in the Columbia laboratory.

A. The simplest is the *alternative test,* as follows:

As quickly as you can, make these sentences correct by drawing a line through the wrong word where two words occur.

1. Days are longer / shorter in summer than in winter.
2. Glass breaks more / less easily than tin.
3. Water always flows up / down hill.
4. Iron is softer / harder than wood.
5. Christmas comes before / after Thanksgiving.
6. Cotton clothing is warmer / cooler than wool.
7. More / Less coal is burned in summer than winter.

8. Oranges are more / less sweet than lemons.

9. The sun shines more / less brightly than the moon.

10. Walking is more / less tiresome than running.

11. The sun rises earlier / later in January than in July.

12. Anything that floats is heavier / lighter than water.

13. Plants grow more / less readily in warm sunshine than in the cool shade.

14. January is longer / shorter than February.

15. A square yard is greater / less than ten square feet.

The first ten alternatives were given to the sixth, seventh, eighth and ninth year groups. For the remaining four groups the five additional alternatives were appended. With the sixth and seventh year groups the alternatives were given orally. In the main, they are the same as used by Bonser, but our determination to present no problems depending for their solution upon knowledge gained at school made it necessary to rule out some of Bonser's alternatives and add others. In the fifteenth alternative we were not as fortunate in ruling out school training as we had been with the others, since children's experience with square measure seems to have been limited to the schoolroom. As these alternatives present but two possibilities, one of which is bound to be right, and as the experiences involved were familiar to the youngest child, the ability to judge correctly was manifested to a very high degree in the youngest group.

TABLE XVI.

Alternative Test.

Group Age.	*Unretarded.* Av. No. Errors.	M. V.	*Retarded.* Av. No. Errors.	M. V.
6	1.5	.9	...	...
7	0.9	.7	...	...
8	1.0	.8	1.0	1.0
9	0.5	.6	1.3	0.4
10	1.1*	.9	5.0	0.0
11	1.0†	.3	1.4	0.8
12	0.2‡	...	0.6	0.3
13	0.3‡	...	0.3	...

*Four of the errors made were on the square yard alternative; if we excluded that the average error is only .6.

†Exclusion of the square yard alternative here would bring the average error to .3.

‡These errors are all due to the square yard alternative.

B. Bonser's test of selective judgment[1] presents the next stage of difficulty. In order to confine this test to an experiential basis, we retained the form and general method of Bonser's test, but used other data. The following is the text of the test as we gave it:

The following reasons have been given to show why grass grows in summer and not in winter. Write "yes" after those reasons you consider good and "no" after the reasons you think poor.

1. Summer is warm and winter is cold.
2. Grass is green.
3. Grass needs warmth.
4. Grass needs sunshine.
5. Cows and horses eat grass.
6. Grass needs moisture.
7. The ground is frozen in winter.
8. Children skate in winter.
9. Grass is sometimes cut for hay.
10. Grass could not grow in the frozen earth.

I made one other deviation from Bonser's method, in that I asked the pupil, before he began his test, why grass did not grow in the winter where it grew in summer. His answer was written at the top of the sheet, which was then handed the child for his own record. In this previous formulation of his

[1]F. G. BONSER. *The Reasoning Ability of Children of the Fourth, Fifth and Sixth School Grades.* Contributions to Education. Teachers College, No. 37, 1910, p. 6.

reason he made explicit the general principle which should be his determinant as to the relevancy or irrelevancy of the statements given. There remained, then, in each selective act two other steps: first, the comparison of each reason with the general principle which he had already stated, and secondly, the selection or rejection of each of these statements on the basis of their relevancy to the general principle. With the three youngest groups the test was given orally and their answers recorded on the text. This made the test about equally difficult, so far as form is concerned, for all the groups.

Four of the statements are irrelevant. Are they judged so? To show distribution of errors we have divided them (Table XVII) into errors of assent and of dissent. As can be readily

TABLE XVII.

Selective Judgment.

Group Age.	*Unretarded.* Average Errors of Assent.	of Dissent.	*Retarded.* Average Errors of Assent.	of Dissent.
6	3.5	...	...	...
7	1.7	.4	...	...
8	1.3	.8	4.0	1.5
9	2.1	.1	3.3	0.3
10	1.1	.1	4.0	...
11	1.0	...	2.0	1.0
12	0.0	.0	0.8	...
13	0.3	.1	1.0	0.3

seen, the average number of errors due to suggestion outnumber the other failures in judgment. Three stages in the development of independent judgment are readily discovered: (1) Assent to all suggestions, illustrated by the reactions of the majority of the sixth and seventh year groups; (2) a realization that there are other possibilities than those suggested. Conflict arises here, but no clear comparison of major and minor premises; (3) a careful and considerate deliberation upon the terms of the problem.

The errors made in this test were due either to inadequacy of the general principle or failure to relate the minor premises to this general principle.

C. Problem-questions. Five problems previously used in the Columbia tests were given to the four oldest groups. The following are the problems:

MICHIGAN STATE NORMAL COLLEGE
TRAINING SCHOOL DEPARTMENT.

1. A boy said: "I know ten good men who are doctors and ten bad men who are policemen. So the doctors are better than policemen." Did he prove it? Why? or Why not?
2. If all the boys who are good in arithmetic are good in spelling, will all the boys who are good in spelling be good in arithmetic? Why? or Why not?
3. If there were no bread or flour, would everyone starve?
4. Is this true, "The more we eat the more we grow?"
5. If there were no schools, would children learn anything?

These seemed better tests of reasoning than any of the problem-questions given in the Binet-Simon series.

The replies were classed as 'complete failures' if the child did not give the right answer. If the correct answer was given without a reason or with an insufficient reason, it was classed as an 'intuitive judgment.' Finally, if the reason given showed a clear perception of the problem, it was classed as a 'reasoned judgment.'

TABLE XVIII.

Problem-Questions. (Reasoning.)

Unretarded.

Group Age.	1st Question.			2nd Question.			3rd Question.			4th Question.			5th Question.		
	C.F.	I.J.	R.J.	C.F.	I.J.	R.J.	C.F.	I.J.	R.J.	C.F.	I.J.	R.J.	C.F.	I.J.	R.J.
10	7	2	..	5	4	..	6	2	1	7	2	..	4	2	3
11	2	2	1	..	5	..	2	2	1	2	2	1	2	2	1
12	..	..	6	2	4	..	1	2	3	1	2	3	1	2	3
13	1	..	6	..	4	2	1	3	3	1	6	..	..	1	6
Retarded.															
10	1	..	..	1	..	..	1	..	..	1	..	..			
11	4	1	..	3	2	..	2	2	1	2	2	1			
12	3	1	..	1	2	1	1	3	..	1	3	..			
13	..	..	3	..	3	..	..	3	..	..	3	..			

C. F.=Complete Failure. I. J.=Intuitive Judgment. R. J.=Reasoned Judgment.

The percentage of reasoned judgments was greater in the case of the first problem. The answer was generally given in some such form as this: "There are more than ten doctors and ten policemen. Ten cases could not prove the truth for all." Even in the narrow range from the tenth to the thirteenth year the growth of reasoning power is marked. In the tenth year, when the child is susceptible to the affirmative suggestion, replies were frequently couched in terms suggested by the question. In the eleventh year there is a large percentage of intuitive judgments: the child has begun to think independently, but without clear formulation of his problem. The twelfth and thirteenth years show a large proportion of reasoned judgments.

D. Definition test. The definition tests which were given by Binet were not arranged in serial form. It seemed to us that such an arrangement would afford the best opportunity to study the development of the ability to form concepts. The terms to be defined were grouped in five pairs, as follows: (1) *Key* and *chair,* (2) *sweet* and *hot,* (3) *kindness* and *pleasure,* (4) *to read* and *to write,* (5) *time* and *number.* The order would perhaps be better had the third and fourth pairs exchanged places in the series.

The results of this test are rather difficult to tabulate, because of the variety of forms in which the definitions were cast. We decided upon three general categories: first, complete failure; secondly, partial definition (all fairly successful attempts, such as definition by use or by illustration or in terms of opposites), and thirdly, adequate definition (clear and complete concepts). Answers that repeated the word to be defined were classed as failures. Such replies as "To read! Why, to read is to read!" were not infrequent among the younger groups.

Adequate definitions were not given, except sporadically, before the eleventh year; even then very few appear. *Kindness* and *pleasure* seem more difficult to define than *to read* and *to write.* On the whole, it seems harder for the child to abstract the essential characteristics and to formulate definitions for the more familiar experiences than it is for him to define adequately a term which has always been more or less

TABLE XIX.

Ability to Define.

Unretarded.

Group Age.	1st Pair. C.F.	P.D.	A.D.	2nd Pair. C.F.	P.D.	A.D.	3rd Pair. C.F.	P.D.	A.D.	4th Pair. C.F.	P.D.	A.D.	5th Pair. C.F.	P.D.	A.D.
6	7	13	..	10	10	..	8	12	..	12	8	..	19	1	..
7	..	20	..	8	12	..	7	13	..	10	10	..	10	10	..
8	..	16	..	4	12	..	6	10	..	6	10	..	8	8	..
9	..	16	..	4	12	..	7	9	..	9	7	..	6	8	2
10	..	12	6	4	14	..	8	10	..	4	10	4	4	12	2
11	..	10	..	..	8	2	..	10	..	1	8	1	..	8	2
12	..	7	9	..	12	4	4	12	..	..	8	8	..	9	7
13	..	10	4	..	9	5	..	14	..	..	5	9	..	7	7

Retarded.

8	2	2	..	2	2	..	4	..	..	4	..	..	4	..	..
9	..	4	..	1	3	..	..	4	..	3	1	..	..	4	..
10	..	2	..	1	1	..	2	..	..	2	..	..	2	..	..
11	..	10	..	3	7	..	1	9	..	4	6	..	2	8	..
12	..	8	..	2	6	..	..	8	..	2	6	..	2	8	..
13	..	4	2	1	4	1	2	4	..	3	3	..	..	6	..

C. F.=CompleteFailure. P. D.=Partial Definition. A. D.=Adequate Definition.

of an abstraction to him. The terms *to read, to write, time* and *number* furnished the best illustrations of the growth of the concept-forming power. Here is an illustration of an adequate definition given by a twelve-year-old boy: "To read is to translate a thought from marks on paper to yourself or to someone else." The most frequent definitions given by the younger groups for this term were similar in form to the one previously quoted as an illustration of a complete failure.

Conclusions.

1. *Value for diagnosis:* In order to determine the value of the tests for diagnostic purposes, it was agreed that prior to the tests neither supervisors nor teachers should give the experimenter any hints as to their experience with the individuals tested. When the tests were completed in a department, I discussed their outcome with the teachers. My results in every case bore out the experience of the teachers, and often threw light on difficulties that had been encountered when dealing with the more difficult cases in regular class work.

2. *Value as mental norms:* The initial question as to the possibility and practicability of the establishment of reliable intelligence-norms, graded by years, which might be substituted for the time-honored examination on subject-matter taught in schools is answered in the affirmative. There is a striking parallelism between growth of intelligence and age shown in the results obtained from the unretarded group. The differences in achievement from year to year were not large, but they were regular, while the two decided leaps in ability shown with advance from the primary stage to the intermediate and from the intermediate to the grammar grade were as surprising as they were interesting and confirmatory of the general theory.

3. *Limitations:* The number of children tested was too small to be made the basis of sweeping generalizations. There were only eighty children in all, ten for each group; of these eighty, fifteen were found upon closer examination of all their school records to belong to the retarded class. So the conclusions are drawn from sixty-five cases. These sixty-five

cases, however, were tested individually, and the results obtained from them are more reliable than from a much larger number of cases tested in groups.

It is desirable that the tests be repeated with more children. The tests should be given individually and to unretarded children only. Reliable norms can be obtained only by standardizing results from the unretarded or typical cases. Tests made at random upon unselected children will only give random results.

4. *Comparative value of tests:* While as a whole the tests proved satisfactory, the learning tests were inadequate—another test should be added to complete the series. The linguistic tests of constructive ability were more valuable than the mechanical, since in the first case it was possible to follow the complete course of the experiment, while in the second case the judgment as to degree of success was more largely based upon final results. Of the judgment tests, the series of definitions reveals the progress in intelligence much more clearly and definitely than do the other tests. Throughout the tests quality of work done rather than the time consumed proved the most reliable measure of intelligence.

Summary of Results to Show Age-Norms.

This summary shows the age-norms for each test as indicated by the results obtained from the unretarded groups.

Sixth Year.

Degree of attention: Not more than 10 or 11 omissions in cancelling a's, Series II.

Perception: Actual perception-time for a-test not above 175 sec., even with slower children.

Comprehension (ability to comprehend a situation): Elements of a picture are not unified. Discrimination does not involve more than objects of sense-perception.

Memory Span. Pictures: Recall five to seven of 20 pictured objects.

Sentences: Repeat without error first seven or eight of Whipple's arrangement of the Binet sentences.

Association (opposites): Average 10.5 associations with the Bonser set of opposites, at an average rate of 150 to 160 sec. per set.

Learning: Dissected Maltese Cross and its numerals associated in 3 or 4 repetitions.

Construction and Invention.

Mechanical: Solve the first and second divided rectangle puzzle, and possibly also the Terman puzzle.

Linguistic: Cannot build words from letters. Can give orally sentences containing the three words: *boy, river* and *ball.*

Judgment.

Alternatives: Choose the correct alternative in about eight of ten cases.

Selective judgment: Fail.

Definitions: May define common objects in terms of use.

Seventh Year.

Degree of attention: Not more than 10 or 11 omissions in cancelling a's in Series II.

Perception: Actual perception-time in Series II a-test not above 80 to 90 sec.

Comprehension: Describe a picture, but fail if asked to give a terse title. Questions are either irrelevant or concerned with some minor object of the picture.

Memory Span. Pictures: Six or seven objects.

Sentences: Repeat without error the first eight or nine sentences in Whipple's list.

Association (opposites): Average 14 correct associations for the three sets of opposites, at an average rate of 140 sec. per set.

Learning: (*a*) Maltese Cross test with two repetitions. (*b*) Colored forms test in 3 or 4 repetitions.

Construction and invention.

Mechanical: Solve all three rectangle puzzles; also, usually understand and solve the Terman puzzle.

Linguistic.

(1) Word-building: Build 5 or 6 words with the 6 letters.

(2) Sentence-building: Construct oral sentences containing the 3 words, and even form them into a narrative.

Judgment.

Alternatives: Choose correct alternatives in nine out of ten cases.

Selective judgment: Governed largely by affirmative suggestion.

Definitions: Give partial definitions in about 50 per cent. of cases.

Eighth Year.

Degree of attention: Not more than 3 or 4 omissions (5 at most) in the a-test, Series II.

Perception: Perception-time in a-test, Series II, not over 60 sec.

Comprehension: Unify picture in terms of action of principal object. Give superficial title. Questions concern minor or irrelevant points.

Memory Span. Pictures: Nine to ten objects.

Sentences: Repeat the first nine, or at best eleven sentences.

Association (opposites): Average of sixteen correct associations in the three sets at an average rate of 110 sec. per set.

Learning: (*a*) Maltese Cross test in 2 or 3 repetitions. (*b*) Colored forms test in 3 or 4 repetitions.

Construction and invention.

Mechanical: No. 1 of divided rectangular puzzles need no longer be given. Solve second and third, the latter within 4 min.

(2) Terman puzzle: Successful.

(3) Clock-face: From 50 per cent. to 70 per cent. succeed.

Linguistic.

(1) Word-building: Five to ten words in 5 min.

(2) Sentence-building: Complete narratives on a theme suggested by the three words.

(3) Ebbinghaus Completion Test: Not more than 50 per cent. of normal eight-year old children attempt the Ebbinghaus test, using story: "Where the Dandelions Went," as given by Whipple.

Judgment.

Alternatives: Average of 1 or 2 errors.

Selective judgment: Exercise some independent judgment. Errors of dissent about equal to those of assent.

Definitions: Definitions are still in terms of use or of opposites. Not able to formulate clear concepts.

Ninth Year.

Degree of attention: Not more than 5 errors in a-test.

Perception: Perception-time not more than 1 min.

Comprehension: Titles given have a certain superficial unity of descriptive phrase or action or are in terms of some attribute of the principal object. In 9 of 10 cases questions refer to some irrelevant or minor aspect.

Memory Span. Pictures: From 6 to 12 objects.

Sentences: From 8 to 13 sentences (Whipple's arrangement).

Association (opposites): Average of 17 correct associations for the three series, at a rate of a little over 100 sec. per series.

Learning: (*a*) Maltese Cross test with not more than two repetitions. (*b*) Colored forms test with not more than 4 repetitions.

Construction and invention.

Mechanical: (1) Solve the second and third divided rectangle puzzle readily.

(2) Terman puzzle solved with little hesitancy.

(3) About 70 per cent. interchange hands of clock by dividing the problem into two steps; a larger percentage makes the first step successfully.

Linguistic. (1) Word-building: Build 5 to 14 words in 5 min.

(2) Sentence-building: Nearly all invent a narrative for the words. Story is of realistic type.

(3) Completion Test: Complete the Dandelion story and get meaning with not more than 35 errors.

Judgment.

Alternatives: Correct alternatives for all 10 sentences.

Selective judgment: No gain in ability over 8-year child.

Definitions: Define in terms of use.

Tenth Year.

Degree of attention: Not more than 3 or 4, or at most 5, errors.

Perception: Time within 1 min.

Comprehension: About same as for ninth year. Number of questions concerning essentials increased to nearly one-fourth of total asked. Irrelevant questions greatly diminished.

Memory Span. Pictures: From 6 to 12.
Sentences: Repeat correctly 9 to 14.

Association (opposites): Average at least 17 correct of each 20 in less than 90 sec.

Learning: (*a*) Maltese Cross test with 2 repetitions.
(*b*) Colored forms test with 2 or 3 repetitions.

Construction and invention.

Mechanical. (1) Puzzles: Solve the second readily and the third in less than 3 min.
(2) Terman puzzle: Complete success.
(3) Clock-face: Eighty per cent. succeed.

Linguistic. (1) Word-building: Build 8 to 17 words.
(2) Sentence-building: Complete narratives.
(3) Completion test: Dandelion story completed with an average of 15 errors.

Judgment.

Alternatives: Not more than 2 errors in 15 alternatives.

Selective judgment: Begin to discriminate between relevant and irrelevant statements.

Definitions: In 90 per cent. definitions are still inadequate.

Problem-question: A very small percentage of correct answers are given to questions involving reasoning.

Eleventh Year.

Degree of attention: Not more than 3 or 4 errors in the a-test.

Perception: No gain over tenth year.

Comprehension: A fair proportion of titles show comprehension of artist's meaning. Ability to question shows little advance over tenth year.

Memory Span. Pictures: From 8 to 15 objects.
Sentences: From 10 to 13 repeated correctly.

Association (opposites): Average 19 correct in less than 90 sec.

Learning: (*a*) As tenth year.
(*b*) Colored forms test with not more than 2 repetitions.

Construction and invention.

Mechanical. (1) Puzzles: Solve rectangle puzzles, the third within 3 min.
(2) Terman puzzle: Solved readily, need not be given later.
(3) Clock-face: Solved in two steps.
(4) Binet cut design: Solved correctly by 65 per cent.
Linguistic.
(1) Word-building: As in tenth year.
(2) Sentence-building: As in tenth year.
(3) Completion test: Dandelion story reconstructed with from 3 to 9 errors.

Judgment.
Alternatives: Average 1.5 errors.
Selective judgment: Discriminate between relevant and irrelevant statements.
Definitions: A few can give adequate, but most only partial definitions.
Problem-questions: About one-third the pupils give a reasoned answer.

Twelfth Year.

Degree of attention: An average of not more than one error in the a-test.
Perception: Time 40 to 50 sec.
Comprehension: Majority of titles are completely unified, though concerned with superficial aspect. A fair percentage of questions involve essentials.
Memory Span. Pictures: From 8 to 10, with average above 11.
Sentences: From 11 to 16.
Association (opposites): Average 19 correct in less than 80 sec.
Learning: (*a*) Maltese Cross associations learned with one exposure.
(*b*) Colored forms associations with two repetitions, as in eleventh year.
Construction and invention.
Mechanical. (1) Third puzzle in approximately 1 min.
(2) Clock-face: Solved in one step.
(3) Binet cut design: Correctly drawn by 70 to 80 per cent.

Linguistic. (1) Word-building: Build 11 to 17 words.
(2) Sentence-building: As in tenth year.
(3) Completion test: Dandelion story completed with 1 to 11 errors.

Judgment.
Alternatives: Not more than 2 errors.
Selective judgment: No errors.
Definitions: Nearly 50 per cent. of definitions adequate.
Problem-questions: About 50 per cent. of problem-questions are well reasoned.

Thirteenth Year.

Degree of attention: Less than one error for the a-test.
Perception: Time as in twelfth year.
Comprehension: Show grasp of real significance of pictures. Over 50 per cent. of questions deal with essentials.
Memory Span. Pictures: As in twelfth year.
Sentences: As in twelfth year.
Association (opposites): Average 19 correct in 60 sec.
Learning: (*a*) As in twelfth year.
(*b*) As in eleventh and twelfth years.
Construction and invention.
Mechanical.
(1) Third puzzle: Solved in a minute and a half.
(2) Clock-face: Solved in one step.
(3) Cut design: Correctly drawn by 80 per cent.
Linguistic.
(1) Word-building: Maximum 17 words.
(2) Sentence-building: As in tenth year.
(3) Completion test: Dandelion story completed with 3 to 12 errors.

Judgment.
Alternatives: Not more than 3 errors.
Selective judgment: No errors.
Definitions: More than half the definitions are adequate.
Problem-questions: More than half the answers are carefully reasoned conclusions.

THE CHILD'S SPEECH.

II. The Mother's Tongue.

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1. The rudest provision which living creatures make for their young is the supply of food. In certain low forms this is the only recognition which the offspring receives. Among the higher organic types arise personal care and protection against danger, but this is at first a simple instinctive reaction and commonly of short persistence. In human life a third element is added which raises man incomparably above his fellows. This is membership in a community, which is mediated by the possession of speech. The mental solitude in which beasts live is inconceivable to men, because they have always been participants in a spiritual culture. The traditional dogma that the individual antedates society is wholly untenable. An organized group awaits the birth of each human child and at once receives him into its care. The infant finds himself a member of a trinity—father, mother and child. It is the common life of the social group which molds as well as nourishes him, and upon its vital atmosphere he is continuously dependent so long as he lives.

2. Within this community one member is of unique importance. The mother is the fountain and center of the child's life. She gives the babe food, she relieves him of pain and comforts him, she quiets him when disturbed, and is a playmate during his happy hours. Spiritually as well as materially the child's existence revolves about that of the mother, and everything connected with her person, receiving significance through its associations, is loved and prized by him.

Among the qualities which the child associates with his mother's presence the voice is pre-eminent, for it symbolizes

as perhaps nothing else can the intimate and manifold relations which ally them. The voice radiates farther than any other attribute the mother possesses. It assures the child of her nearness in the dark and runs before her as she approaches his room. It is not their only bond; many other things, because they help to establish a strong and tender connection between the two lives, become part of this ideal complex in the child's imagination—the affectionate glance which dwells on him long and lovingly, the soothing and caressing touch, the strong hands always ready to bear him up—nevertheless the voice swiftly becomes the most intimate and thrilling medium between their two spirits, before speech as such has attained any significance.

Thus out of the elementary relation of mother and offspring arises the early and profound influence of the voice upon the child. It is the first personal bond which is established between him and the world. The voice appears as a beneficent power, cheering, comforting, consoling—at once a solace and a delight. Above all, its perpetual song is an activity into which the child himself can enter. It is not a mere identifying mark of the mother's presence, objective and inimitable, to be recognized or dwelt on in imagination; it is a possession which the child shares with the mother, and through it her spirit increasingly penetrates his life and becomes a part of his own personality.

Such participation in the activities of others is the characteristic form of evolution in the individual self at large. Through it comes all later sense of community and upon its existence rests the very structure of society itself. This sympathetic interpretation of other lives receives its first clear embodiment through the medium of the voice, which gives mother and child community in the spiritual world.

3. The power thus to reproduce the tones of his mother's voice, and so not only to respond to her approaches, but also to supplement her presence, affords the child keen delight and soon becomes a solace to which he has constant recourse. What is so intimately connected with the presence of the loved one—song, speech, laughter—he can reproduce through his own activity. It is not only taken over from the objective

world into himself, but is voluntarily reproducible at any moment, and the delight which the child has in hearing the speech of his mother is continued during her absence in consequence of this use to which his own voice can be put. The pleasure which the young child takes in cooing and babbling is in part referable to the associations of these sounds with the comforting presence of his mother. Love and activity are the twin sources of his early delight in the voice and of his constant employment of it before the actual imitation and use of articulate speech-forms has been begun.

Throughout the child's experience the tones of the human voice are knit up with care for his wants, with relief of his pain and with participation in his pleasures. The mother's fondling as well as her tendance issues in speech—in crooning and lullaby, in soft whispers and hushing sounds, in bright and happy song, in sympathetic and pacifying words. In distress the child turns to it for comfort; when he has been left alone, it is the earliest signal of his mother's return; no occasion in the daily routine of experience is complete without it. Everywhere speech looms large in the happy associations of the child's world, and in literal truth he can now scarcely be happy unless his mood be ratified by the mother's voice.

The sound of the voice, loved and prized for its associations, becomes a constant recourse of the child. He is happy in its use as well as in hearing it. Laughing, cooing and babbling, which are called the natural and universal expressions of a joyful mood, take on a new value from their happy associations. The use of the voice is no longer merely the reflection of a mood independently originated; it has become the medium by which a happy mood is established. Its employment in a sort of wild music now constitutes a conscious part of the child's means to happiness, and he gives it incessant practice. His life becomes an echo of the mother's speech, faithful through all its shortcomings in its reflection of hers. There you may catch her tones and inflections, her laughter and whisper, even the very melody of her speech repeated.

4. It is this fine though unconscious faithfulness of the child to the model he imitates which makes good speech in the home imperative. The vice of impoverished utterance, into

which most of us have fallen, arises not so much from a defect of school training as from unhealthy home surroundings, in which the thought of the child is cramped and his feeling allowed to stagnate through the lack of a rich and flexible medium of expression. It is in the intimate life and conversation of the family circle that the child not only acquires the rudiments of speech, but also receives his first impressions, unconscious but lasting, of its values and beauty. As a vigorous intellectual activity can be stimulated and sustained only in the medium of a highly cultured speech, so can the ear be tuned and a sense for fit and noble diction fostered only where good speech is prized and daily striven after.

In all great and vital literature the child will find such stimulation and discipline, but his independent approach to this source of training comes only at a later period, when the example of home usage has already had its effect for good or ill. When that epoch is reached the child should find himself already at home with the spirit of good writing and possessed of that bias in its favor which only hourly contact can give.

For this illuminating and refining contact with good speech the child should be indebted to his home environment. Long before he can choose and read for himself, even before he is acquainted with his letters, he should know much that has a place in this high field. The great stories and noble poems of every literature are written in words so simple that a child can understand them, and his first acquaintance with the songs and tales of his own people should be made in the nursery as he listens at his mother's knee.

5. In this phase of the child's development it is not chiefly a question of vocabulary, nor even of grammar, though from the beginning a flexible vehicle and good usage are important. It is the quality of voice and articulation which are now most subject to modification. The organs of speech grow to the mode in which they are exercised, and the development of that multitude of defects which commonly marks the later voice receives its first stimulus in infancy from the harsh and slovenly speech which the child hears about him.

In the period just preceding intelligent speech the voice is near the height of its plasticity. It has developed a wide

range of modulations, in force, inflection, and even tone, of which more generous and spontaneous use is made than perhaps at any later date. It is extraordinarily sensitive to modifying influences and eagerly engaged in extending its own activities. The child delights in sounds, and imitates all kinds of noises, incessantly repeating, varying and combining them. In this imitative and experimental process the voice is taking shape, though it is still far from any condition of finality, and its range of tones, richness of modulation and general compass and flexibility as a medium of speech are receiving their first determination. That long process has already begun which is necessary to bring any human voice to its full perfection as an instrument of musical and expressive speech. In its earliest stages this development is unreflective and unsystematic. The child aims at no ideal end, nor is any technical voice training afforded him. Unconsciously, by daily and hourly contact, the quality of the voices he hears and the use to which they are put are molding his speech in vocal character and inflection as really as in vocabulary and pronunciation. If these voices are harsh and thin, his will lose something of its natural sweetness; if they are strident from long abuse, his will become coarsened through reflex strain; if they are stiff and lack dramatic variety, those subtle modulations of the young voice in which lies much of its charm will be gradually subdued to the dominant monotony.

The question is not one of teaching, but of habit and ideal. No formal instruction nor even stated drill will offset the effect of perpetually repeated example. The habits of speech prevalent within the family are the most potent factor in molding, for better or worse, the child's conception and use of language.

6. The forms of speech which daily intercourse presents to the child are abundant and varied. The mother tongue is whispered and murmured, crooned and sung to him. It appeals directly to his attention in all his occupations and forms a part of every response to his needs. It is heard in the common intercourse of the family circle when not directed to him as an individual. It reflects every shade of feeling on the part of those who use it, and presents manifold variations on the

lips of father, mother, brother and sister—in pitch, volume, timbre, rate and dramatic inflection. The child has the whole range of terms which family discourse comprises set before him, and the interest which attaches to the situations in connection with which speech is used stimulates a close attention to it.

The training in speech is thus no intermittent process, but one which is renewed day by day and hour by hour in the life of the child. Language is the spiritual medium in which he lives and moves from the outset of life.

7. In his attempts to master this medium needless difficulties should not be set in the child's way. For its slovenly and impoverished speech, it may be said, the family is not responsible. The habit is a social inheritance fixed by early example and training which the parents cannot now alter. But the older members of the home circle often seem to go out of their way to interpose obstacles to the child's progress in the use of normal human speech. Each word in any language is a precise sound-form which is mastered most quickly when it is presented without variation in form. In his attempts to pronounce the words of his mother tongue the child inevitably introduces modifications in these sound-forms because of the imperfection of his own organs and the inherent difficulty of the movements which their production involves. But the process of learning cannot be simplified by interposing a system of modified word-forms for the child to imitate, no matter how much easier they may be than the words they replace. The impulse which leads the mother to transform the words of her speech into baby-talk is at best the reflection of an absurdly misguided logic. It is these precise word-forms which must be mastered in the end, and every such procedure is a psychological complication which the child should not have to endure. So far as understanding is concerned, the simplification is uncalled for. The child apprehends the mother's speech, and it is the words as she utters them which he is trying to reproduce. As for articulation, it merely confuses the child and distracts attention from his true aim. In so far as the substitution is successful the task of learning to speak, instead of being lessened, is simply doubled and the child's

progress sensibly delayed. In most cases, indeed, no great harm may be done by baby-talk, but its use is always an unwise concession to the mother's weakness, and in exceptional cases its employment has proved disastrous in fixing the child's physiological stammering as an obstinate habit of speech. The child has a right to the best that home speech can offer, in purity of form no less than in richness of cultural content.

The double significance which human speech possesses, both as the instrument of all future intellectual activity and as the medium of human intercourse at large, makes every phase of its development in the individual a subject of interest to the student no less than of importance to the teacher. The earliest stage in this formal evolution will be taken up in the next paper of this series.

(To be continued.)

THE WRITING ABILITIES OF THE ELEMENTARY AND GRAMMAR SCHOOL PUPILS OF A CITY SCHOOL SYSTEM MEASURED BY THE AYRES SCALE.

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In connection with the preparation of both the Thorndike and the Ayres scales for the measurement of handwriting it has been frequently stated that one of the values of such standards would lie in their furnishing a means of comparing the writing abilities of children of different ages, grades, schools and cities.

In the following study the attempt was made to apply the Ayres scale to the writing of all grammar and elementary school children of a small city school system, with reference to determining the age, grade and school variations in legibility of handwriting. It was thought that such a study would be a valuable test of the practicability of the scale itself.

If all samples of writing were judged by the same person without reference to age or grade, and the resulting grades showed a definite progression in these two particulars, it would seem to indicate that the scale is really workable. The object was then to compare grade with grade, age with age, and school with school. It was thought possible that the resulting grades might throw some light (1) upon the relative efficiency of the writing supervision in the different schools, and (2) upon the question as to whether increase in writing ability by both age and grade is continuous.

One set of 34 samples was graded independently by eight persons to determine how far the rankings of different judges will tend to vary. The results of this part of the study throw

some light upon the extent to which the scale furnishes a real objective measure of writing ability.

The material for the study was secured by having the teachers hand out to the children at the regular writing period slips of paper with a typewritten sentence at the top. The pupils were asked to copy the sentence in their ordinary hand, *i. e.*, as they commonly wrote day by day. In this way we secured 966 specimens from the 1st to the 8th grades, ages from 6 to 17 years.

The Scale.—The grades on the Ayres scale are supposed to represent eight equal steps from very poor to very good writing. These steps are designated by 20, 30——90. Under each grade three specimens of writing are given—vertical, medium slant and full slant. The grade 20 represents very poor writing, while the other end of the scale, 90, represents a degree of excellence seldom attained in the public schools. To grade a specimen one is instructed to slide it along the scale until "a writing of corresponding quality is found."

Grading.—This is naturally a difficult task, in spite of the excellence of the scale. It is impossible to eliminate altogether the subjective element in judging of the merit of the samples. This is proved in part by the fact that competent judges are bound to vary somewhat in their rankings of the same specimens. The range of this variation will be discussed in a later paragraph. Another subjective difficulty which is even more serious is the inability of a single judge to be entirely consistent even at a single sitting. Try as he may, he is apt to rank a very good specimen too high if it follows immediately after a very poor one. It would no doubt have been better if all the specimens could have been tentatively arranged in eight groups according to the grades of the scale, and then all the samples of each grade should have been compared with reference to the standard samples of that grade in the scale. In this way a single judge could obtain a more accurate rank for each specimen than when each sample is measured as far as possible by applying it by itself to the scale.

In determining the ranks of these 966 specimens the judge did not, as far as he was aware, pay any attention to or think of the age or grade of the child.

There are six elementary schools in the system and one grammar school, which are here designated A, B, C, D, E, F, and Grammar, respectively.

SCHOOL A. (First Ward.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Deviation.	Deviations of Various Grades from School Average.
1 A	26	23.	6.4	—18.
2 B	5	36.	7.2	— 5.
2 A	12	30.	4.0	—11.
3 B	10	38.	8.4	— 3.
3 A	14	42.	7.9	1.
4 B	7	47.	6.1	6.
4 A	8	48.	7.4	7.
5 B	16	45.	5.6	4.
5 A	6	51.	8.3	10.
6 B	13	50.	7.2	9.

Average Grade for School A, 41.

SCHOOL B. (Second Ward.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Indiv. Deviation.	Deviations of Various Grades from School Average.
1 A	16	36.	8.0	—4.
2 B	16	36.	5.5	—4.
2 A	4	35.	5.0	—5.
3 B	9	40.	8.8	0.
3 A	13	41.	5.7	1.
4 B	12	44.	6.6	4.
4 A	14	43.	7.5	3.
5 B	30	44.	5.7	4.
5 A	26	44.	6.7	4.

Average Rank of School B, 40.

SCHOOL C. (Third Ward.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Indiv. Variation.	Deviations of Various Grades from School Average.
2 B	9	41.	5.9	—4.
2 A	12	47.	3.8	2.
3 B	12	45.	4.6	0.
3 A	13	52.	4.7	7.
4 B	11	49.	5.	4.
4 A	15	52.	3.2	7.
5 B	18	42.	7.1	—3.
5 A	20	47.	5.5	2.
6 B	17	39.	5.6	—8.
6 A	13	44.	5.8	—1.
7 B	17	44.	6.7	—1.
7 A	12	45.	6.5	—0.

Average Rank of School C, 45.
Average Rank of Grades 2 B-5 A, Inclusive, 46 +.

SCHOOL D. (Fourth Ward.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Indiv. Variation.	Deviations of Various Grades from School Average,
1 A	4	20.	.0	—20.
2 B	10	27.	7.0	—13.
2 A	17	35.	10.3	— 5.
3 B	18	41.	7.0	1.
3 A	4	42.	7.5	2.
4 B	13	49.	5.6	9.
4 A	22	46.	7.2	6.

Average Rank of School D, 40.

SCHOOL E. (Kirkwood.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Indiv. Variation.	Deviations of Various Grades from School Average,
1 A	8	23.	3.7	—14.
2 B	4	40.	0.0	— 3.
2 A	9	37.	3.5	0.
3 B	8	42.	7.5	5.
3 A	7	38.	4.9	1.
4 B	7	41.	4.9	4.

Average Rank of School E, 37.

SCHOOL F. (Shimek.)

Grade.	No. in Grade.	Average Rank of Grade.	Average Indiv. Variation.	Deviations of Various Grades from School Average,
2 B	7	27.	4.1	—14.
2 A	2	35.	5.	— 6.
3 B	3	36.	4.5	— 5.
3 A	5	44.	4.8	3.
4 B	7	44.	4.9	3.
4 A	1	60.	0.0	19.

Average Rank of School F, 41.

GRAMMAR SCHOOL.

Grade.	No. in Grade.	Average Rank of Grade.
6 B	37	49.
6 A	59	51.
7 B	41	57.
7 A	42	59.
8 B	46	59.
8 A	52	57.

AVERAGE RANKS OF THE VARIOUS GRADES OF THE ENTIRE CITY.

	Ranks.	No. of Cases.
1 A	22.	67
2 B	34.	51
2 A	37.	56
3 B	41.	60
3 A	44.	56
4 B	46.	57
4 A	48.	60
5 B	44.	64
5 A	46.	52
6 B	47.	54
6 A	50.	72
7 B	54.	58
7 A	56.	54
8 B	59.	46
8 A	58.	52

This table gives the distribution of ranks by ages of 817 pupils. Some specimens were thrown out because no age was given:

Age.	No. of Cases.	Grade.
5	4	28.
6	43	28.
7	63	35.
8	95	41.
9	107	45.
10	114	46.
11	104	47.
12	97	52.
13	98	55.
14	57	54.
15	29	51.
16	4	53.
17	2	70.

A number of interesting points may be noted in these results. For example, it is evident that a single judge can apply the scale with a fair degree of consistency, as is shown by the steady improvement manifest in the various grades from the 1st to 8B. The grades 5B, 5A and 6B are the only exceptions. Of these, 5B shows the only marked deviation from the upward trend. The 8A is also slightly inferior to the standard set by the preceding 8B. It is sometimes stated that there are fluctuations in pupils' improvement in handwriting. In this city the 5B and 8A seem to be grades of deterioration rather than of improvement. The most striking improvement is made by the 2B over 1A, a gain of 13 points being shown by this study.

MICHIGAN STATE NORMAL COLLEGE
TRAINING SCHOOL DEPARTMENT.

An examination of the age distribution shows the greatest progress between the six- and seven-year-olds (excepting the two cases 17 years old). The age progress is steady up to 14, when there is a slight drop, and another drop is shown by the four cases of 16 years. The standings, however, beyond 15 years are probably not indicative of anything, as the cases are then too few.

It will be noted that the six elementary schools rank fairly close together. School E, which ranks the lowest, 37, contains pupils up to the 4B only. School C, which ranks highest, has small 6th and 7th grade classes. As these classes show a minus deviation from the school average of 45, it is evident that the lower grades are much superior, since they offset the inferiority of the upper grades. The average of the first five grades in this school is 46 +. It will be noted, however, that no samples of 1st grade writing are furnished, a fact which tends to push the average of the school slightly upward.

It would seem from the returns from these six elementary schools that the instruction in handwriting is fairly uniform. Whether these grades have attained the degree of excellence they should can only be determined by comparing them with rankings of the same grades in many other localities. No special method of teaching writing is used in these schools. A medium slant is taught, and some of the teachers try to encourage a muscular movement to some extent. In the grammar school the "Palmer method" is used under the direction of a special writing teacher. This accounts in part for the superiority of the pupils in this school.

The question may properly be raised as to whether the results would have been materially different if the specimens had been ranked by several judges instead of by one only. In order to determine this, 34 specimens were taken at random from the entire collection and were graded independently by eight competent judges. In the following table are given the averages of the ranks assigned by these eight persons to these specimens. In a parallel column is given the average deviation of the different judges from the average rank, and in the third column are given the deviations from these averages of the rankings of the person who ranked *all* the specimens:

Average of the Ranks of Eight Judges.	Average Individual Deviation of Eight Judges.	Deviation of the Single Judge from the Average of Eight.
20	0	0
29	6.5	—9
27	7.5	—7
26	6	—6
27	7.5	—7
51	4.5	—1
41	8.5	—9
54	6	—4
41	6.5	9
64	5	—4
54	7	—4
46	7.6	—6
49	4	1
54	7.6	—4
46	9	—6
52	9.5	—12
49	6.5	—9
55	10.5	—5
67	8	—7
31	2	—1
49	6.5	—9
44	6	—4
54	6	—4
22	3.5	—2
35	7.5	—5
47	4.7	3
45	5	—5
51	4.5	—1
44	9.4	6
49	6.4	1
46	5.2	—6
32	3.5	—2
59	6.5	—9
69	4.2	—9
	Av. 6.1	Av. 4.8

Since the specimens on the standard Ayres scale are placed 10 points apart, *i. e.*, 20, 30, 40——90, it is significant that in every case but one the average of the deviations of the eight judges is below 10 and the *average* of these average deviations is only 6.1. This seems to indicate that, while it is impossible to eliminate entirely the subjective factors in judging handwriting, it may be reduced to a small quantity in the use of this scale. That is, while a given specimen cannot be measured with the same exactitude that a linear distance may be measured by a foot rule, it may be measured within a range of .6 of the distance on either side to the grade above or below.

It is significant also to note that the deviations from these average rankings of the judge who ranked all the 966 specimens is not large, his average deviation being only 4.8, indicating that the ranking of the entire set of 966 by eight judges would not have differed markedly from the ranks assigned by this single judge.

COMMUNICATIONS AND DISCUSSIONS.

PICTURES OF PSYCHOLOGISTS — DO YOU WANT THEM?

Having *The Open Court* pictures of psychologists and philosophers, I have often wished that I had those of present-day psychologists on the walls of my recitation-room. I have thought of writing to psychologists for their photographs, but that would be a good deal of trouble, and if a number followed that plan it would become a nuisance to those whose pictures were most desired. A continuation of *The Open Court* series would be desirable, but who is to decide which of the living men should be included, and would not such a series be unprofitable because of its inclusions and omissions?

The following plan occurs to me as a means of getting what is desired without any of the above disadvantages: Let those desiring photographs name the ones whose pictures are desired to the one who is willing to take charge of the matter. That one can then procure one photograph of each person named and have a plate made from it of the same size as *The Open Court* series and arrange with a photographer to furnish photos from these plates at a reasonable rate.

Are there enough who desire such pictures to make it worth while to inaugurate the plan? This can be answered if all who are interested will at once write to me signifying their desires and naming at least a few of the men whose pictures they wish. Prominent educators and perhaps other men of science might be included if they were asked for. If interested, do not fail to write at once.

E. A. KIRKPATRICK.

Fitchburg, Mass.

ABSTRACTS AND REVIEWS.

M. E. SADLER (Editor). *Moral Instruction and Training in Schools.* Report of an International Inquiry. London: Longmans, 1909. Two volumes, pp. lviii, 538, and xxvii, 378. Price 5s. per vol. Each volume contains an account of the inquiry, the personnel of the committee and the advisory council, the topics of the questionnaire sent out, bibliography classified by countries, table of contents and index.

G. SPILLER. *Moral Education in Eighteen Countries.* Report on Moral Instruction (general and denominational) and on Moral Training in the Schools, etc. With two introductory essays and an annotated bibliography of about 750 volumes. London: Watts, 1909. Pp. xv, 362. Price 3s. 6d., paper.

Sadler's Introduction to the volumes of the first report excellently meets a decided need. In a comprehensive and systematic way it summarizes the results of the investigations, analyzes them into their chief factors and elicits some order out of the chaos of divergent opinions and practices. Moral education is regarded as the central issue in the complex of present educational problems. While the school is only one among the social agencies involved, its influence might be rendered more fruitful. In spite of the unsettled condition of modern ethical opinion, an acceptable and authoritative social ideal may be found in an educational code if it is not minutely prescriptive. As to sanctions, the personal and the social or civic are grounds of general agreement; but they must be supplemented by the religious, and here differences of personal conviction must be respected. Methods must vary widely for age, sex, individual type and kind of school. The three most potent factors in moral education are, first, the teacher's personality; second, the school's corporate life; third, the curriculum. The teacher's personality must be trained, professionalized and cherished by the administration, and must consult the spirit and the demands of the social *milieu*. The corporate life of the school may be wholesomely developed by suitable equipments and organiza-

tion, including games and some measure of self-government, both of pupils vs. faculty and of the individual school vs. educational bureaucracy. In the curriculum the Bible and literature have the prime influence, after which come history, mathematics and natural science; music, drawing and occupations are of recognized value; the competitive examination system has its dangers; systematic practical instruction on social, civic and economic questions should have more place in the school. Training and instruction should be distinguished, and two extremes of opinion and practice are clearly indicated: the first, exemplified in Dewey's views and various radical school experiments in the United States and Europe, emphasizes moral training through the real dynamic life of the school community; the second, exemplified in the French schools, emphasizes the didactic function of the school, with the teacher as leader and master of his obedient and diligent pupils. These two functions should both be largely depended upon. While much valuable moral instruction may be incidental and through occasional addresses or private advice, the tendency is to give increased place to systematic instruction, and this policy is approved by the committee.

Even to mention all the important papers in this work is beyond the scope of this review. Part I presents brief discussions of ideals, methods and sanctions by Dr. F. H. Hayward, Prof. J. J. Findlay, Prof. John Adams, Mrs. Bryant and others. Nearly 400 pages of Part II are devoted to Great Britain. Boys' and girls' schools, secondary and elementary schools, coeducation, teacher-training, Sunday and adult schools and the conditions in Wales, Scotland and Ireland are each treated in one or more chapters. The papers comprise individual essays, symposiums by various groups of educators, summaries of evidence or questionnaires and other co-operative contributions. Among the most significant papers are those by H. B. Smith, Miss S. E. Wells, Miss A. Ravenhill, Rev. J. E. Carpenter, A. Rowntree and Miss E. P. Hughes. In Volume II France is given over 100 pages, with studies by H. Johnson (about the best chapter in the collection), Rev. E. Myers, Miss E. F. Jourdain and others. Other noteworthy chapters are those by J. H. Yoxall on "The Conflict of Opinion in Belgium," etc.; Miss H. Forchhammer on Denmark, G. Spiller on Switzerland and Germany, P. Chubb, W. A. Baldwin and J. D. Burke on the United States, and Baron Kinuchi on Japan.

In his survey of Moral Education in Eighteen Countries, Spiller points out in the chapter on "The Churches and Moral Instruction" the social changes that involve changes in the work of the schools: the growth of industry, democracy, urban population and science has meant the growth of popular universal education, and this has implied state support and control. Both the state and public opinion have become more ethical and less theological. The state cannot control denominational ethical instruction, which is charged with certain inherent defects: the average per cent. of time that the religious lesson gives to ethical content is too small, the pedagogical methods employed are not ethically fruitful, the ethically obvious is stressed at the expense of the development and refinement of moral judgment, as a textbook the Bible is inadequate, and Christian ethics are too narrow and one-sided: other-wordly fanaticism displaces tolerant humanism, we have negative morality vs. the cultivation of the natural virtues, the personal and subjective viewpoint vs. the social and civic, and the modern development of society is either neglected or its bearing on morals denied. But different religions or denominations seem to be substantially equal in their influence on the moral ideal and on conduct; therefore, it is inferred that morality depends rather upon the social than the religious sanctions. As the rest of the curriculum has been gradually secularized, such should be the next step for moral instruction.

Chapter 2 is rich and suggestive in its content, and of marked value. It is both polemical and constructive. We can only briefly review the argument: The aim of education must be really ethical, *i. e.*, more than intellectual, and this should imply agreement about aims and sanctions. The moral aim prevalent in the scholastic mind is too narrow: ethics should include (1) general morals, (2) civics, (3) social economy, (4) general civilization, (5) hygiene; and it has both personal and social aspects. *"The one educational method par excellence is the communication of enthusiasm from teacher to pupil," i. e.*, permanent interest. The ethical (*i. e.*, the humanistic and pragmatic) aspect of every school subject should be emphasized, but incidental and correlated moral instruction alone is inadequate; it needs to be also direct, systematic and separate both from the other subjects and from religion. Several pertinent objections to this view are well discussed, *e. g.*, that morality is dependent on theology; that virtue can't be taught; that experience and the teach-

er's personality are more effective than instruction; that men are not good enough to teach morals; that such instruction would be liable to exploitation by political, economic and theological parties, and that it is dry and cold. The teacher of morals should be like the teacher of any other subject in his enthusiasm, his freedom from external restriction, the kind of motives he appeals to and his emphasis on system. The author here examines a number of current schemes of moral instruction as to the mode of organization of the course, *e. g.*, teaching one virtue after another; emphasizing principles like conscience, freedom, responsibility; special subjects each year; the spiral plan, and the systematic treatment of the relations of life as in the French system. He seems to prefer a modified form of the "systematic treatment of the relations of life," and gives a suggestive and constructive treatment of it in section 25; he emphasizes also the teaching of the four cardinal virtues in their modern meaning, and the connection of the personal and social phases of ethical instruction. The most valuable positive suggestions on aims and methods are given in section 21, *e. g.*, the emphasis on positive methods, on both habituation and reflection, on the distinction of present and future duties, on a broad generous human conception of life, the use of reality vs. fiction, the active side, the need of lengthened school life.

Forty pages of valuable notes to these chapters are given, mainly quotations from ethical and educational literature. These are full of suggestion, and exhibit the actual attitudes of thinkers and authorities in different localities.

Part II contains the report on the 18 countries (all the colonies and divisions of the British Empire, while separately treated, are grouped as one). These reports quote liberally from laws, school codes, syllabi and courses; and they epitomize the conditions for elementary and secondary education, and for denominational and secular instruction. Of special value are the reports on Austria, Belgium, England, France, Germany, United States, Italy and Japan. All of these should be very useful as reference or source material.

Part III contains over 50 pages of bibliography classified according to countries.

E. L. NORTON.

Minneapolis, Minn.

ARNOLD L. AND BEATRICE CHANDLER GESELL. *The Normal Child and Primary Education.* Boston: Ginn & Co., 1912. Pp. 342. $1.25.

No more helpful and inspiring book has been written for teachers in the last 20 years than this unique volume by Dr. and Mrs. Gesell of Yale University. In these days when pedagogical treatises are so stereotyped, pedantic and lacking in wholesome individuality it is refreshing to find an educational book which is *different,* while at the same time thoroughly sane and based on the best that genetic psychology and experimental pedagogy have to offer. This volume is distinctly not of the ephemeral type. Because it deals with the eternal verities of child life and educational method, and in language which is at once simple, direct, incisive and picturesque, the volume will remain for many years a classic of its kind, comparable in this respect to Ellen Key's *The Century of the Child,* Jane Addams' *The Spirit of Youth* or Dewey's *School and Society.*

The book is the best which has yet appeared in this country on primary education. The first 125 pages present most interestingly the historical and genetic background to the problem of primary education. This division, which has for its purpose to broaden the teacher's professional outlook and to give a liberalizing, biological point of view for the interpretation of child nature, contains such chapters as the biological perspective, the primitive ancestry of the child, instinct and relaxation, touch and the appreciation of things, etc.

Then follow 13 chapters on the pedagogy of the primary school, covering in a strikingly original, stimulating and helpful way the following topics: Drawing, dramatic expression, phonics and speech, language, handwork, literature, reading, handwriting, nature study, busy work, outdoor play, morning exercises, discipline, etc.

The last division contains six excellent chapters on the conservation of child life. Three of these, "The Saving Sense of Humor," "Formalism and Child Personality" and "Childhood, the Foundation of Youth," are nothing less than classical in thought and expression. The book is inspired by a profound insight into child nature and by a rare sympathy for it. Dr. Gesell is a new and inspiring apostle of the rights of children, and believes that the educational possibilities of childhood have been pitiably underestimated. Much of his language combines the ring of Rousseau, the sincerity of Pestalozzi and the pithiness of Emerson. Fundamental and neglected truths

are so expressed as to compel conviction. The teacher's fallacy *par excellence* is that of looking at the educative processes and child life itself from the adult and logical point of view. It is a fallacy from which each generation of teachers must struggle anew to escape. To make teachers genuinely sympathetic with the untamed and natural instincts of childhood is one of the greatest services that can be rendered to the cause of education, and this the present volume does far better, in the reviewer's judgment, than any other book ever written for teachers.

LEWIS M. TERMAN.
Stanford University.

A. L. LOWELL. *College Studies and Professional Training.* Educational Review, 42: October, 1911. Pp. 217-233.

W. D. WALLIS. *Significance of President Lowell's Statistics.* Educational Review, 42: December, 1911. Pp. 514-516.

The educational problem raised by Harvard's president has obvious practical as well as theoretical significance. The question discussed is: Do the graduate students in the Harvard Law and Medical schools reveal in their scholastic attainments (grades) evidences of the type of work, whether mainly literary or mainly scientific, previously pursued as undergraduates in the college of arts and sciences? From the statistics at his command President Lowell answers in the negative. That is, a graduate student in medicine who specialized in science as an undergraduate in college may not be expected, on that account, to stand better in his classes than a student who had not previously specialized in science (save, perhaps, for a short time at the start). He believes that it makes slight difference what subjects a student pursues; that the important thing is the way he does his work. Subject-matter is transferred to a very small extent, mental processes considerably, and moral qualities, like diligence, perseverance and intense application, indefinitely.

Mr. Wallis, in criticism, argues that cramming before examinations might account for high marks just as well as daily diligence and application; that things have been compared that are not mathematically comparable, *e. g.,* it has been assumed that all the students made equal efforts to secure high grades, whereas it is likely that many students sought a broader culture, with little thought of grades. He argues, further, that habits developed in undergraduate work in science might be of actual disadvantage in the more careful technical work of the medical school, and that it is conceivable that

lazy students secured high grades by electing collateral scientific courses. On the whole, then, he believes that Lowell's conclusions do not necessarily follow from the evidence. Statistics from another university might very well yield an opposite result. Moreover, experimental investigation supports the existence of a partial transfer of training.

A. S. EDWARDS.

Cornell University.

FRANZ BOAS. *The Mind of Primitive Man.* New York: The Macmillan Company, 1911. Pp. 294. $1.50 net.

This book comprises the course of lectures delivered before the Lowell Institute, Boston, 1910-11, and presents in amplified form materials previously set forth by the author in a number of essays and bulletins. The author first undertakes to clear the ground of racial prejudice. The civilized white man of today regards his race as representing the highest possible type. He thinks his achievements are the greatest of any race, and argues therefrom that his aptitude for civilization is greatest, and that his bodily and mental mechanism is of a superior nature. But, in Boas' opinion, the superior culture of the white race is due to accidental causes, not to superior capacity for culture. Twenty centuries ago several other races had a civilization equal to that of the then existing white races. Since then historical conditions have favored the white race and retarded the other races. In anthropological traits the white race is in some respects inferior to other races. Nor can we correlate mental ability with physical traits in any way to argue superiority of the white race.

Characteristic features of the mentality of mankind are the use of articulate language, the use of implements and the power of reasing. In these features primitive man differs, to be sure, from the civilized white man, but still he is not really inferior to him. The language of primitive man, for example, is based upon a different classification of phenomena, but serves his purpose more effectively than would a developed language of civilization. Mental traits which are, however, characteristic of primitive man are the emotional association of habitual activities and the tendency to invent rationalistic explanations for them, the tendency to accept the crude experiences of previous generations without the analysis common to civilized man, and the symbolic nature of his art.

Boas reproduces here his interesting conclusions that immigration to America has had a direct effect upon the skull dimensions of chil-

dren of foreign parentage born on American soil. Other instances of direct effect of environment on bodily form are found in the changes of type due to the transfer from a rural to an urban life—changes, however, which do not appear to exceed certain definite limits.

The volume concludes with a discussion of race problems in the United States.

Boas' work challenges attention and will undoubtedly stimulate discussion. The form of presentation, however, is obscure, and many parts make difficult reading. HENRY MAYER.

Cornell University.

PAUL R. RADOSAVLJEVICH. *Professor Boas' New Theory of the Form of the Head—A Critical Contribution to School Anthropometry.* Reprinted from the American Anthropologist (N. C.), 13: No. 3, July-September, 1911. Pp. 394-436.

Professor Boas' study of the physical types of immigrants in New York city, conducted under the auspices of the Immigration Commission, resulted in certain surprising and novel conclusions, viz., that the head-form, hitherto considered a permanent racial characteristic, was rapidly modified by the influence of American environment, and that different types of head-form tend to converge toward a common type. This conclusion, which is in fundamental opposition to all hitherto established anthropological theories, is critically examined by Dr. Radosavljevich, who brings forward the following objections: (1) Boas' theory of the head-form does not agree with his own data. (2) The normal differences in degree of particular types studied are probably due, not to the "American soil" or "financial panics," but to countless methodological, technical and mathematical difficulties inherent in the investigation. (3) Boas' method of collecting data is uncritical. (4) Boas' theory is based on a "cross-section" of the facts rather than on a genetic interpretation of them. (5) Boas began and finished the investigation without adequate scientific exactitude and caution. HENRY MAYER.

Cornell University.

V. VANEY. *Les Classes pour Enfants arriérés.* Bulletin de la Société libre pour l'Étude psychologique de l'Enfant, No. 68, Février, 1911. Paris: F. Alcan. Pp. 53-152. 1 fr. 50.

In 1904 a commission was appointed in France to determine how the compulsory education laws could best be applied to abnormal

children, with reference particularly to the types of schools and classes needed, the conditions of admission, the selection of teachers and the pedagogic methods to be followed. The present bulletin contains the conclusions reached by this commission.

Special classes for backward children, to be termed "improvement schools," are to be annexed to regular schools. Admission is to be made after medical and pedagogical examination, and on recommendation of a board comprised of a physician, a primary-school inspector and a director of special schools. The classes may number 15 pupils, but 12 is better. Pupils may be admitted at the age of 6 and remain until 16. In instruction emphasis shall be placed upon concrete material, with stress on singing, dancing, manual work, school games and gymnastics. Girls are to receive training in sewing, knitting, weaving, basket work, bookbinding, simple housekeeping, etc.; boys must have a work shop, with opportunity for work with wood and iron; a school garden is recommended for every school for backward children, and attention to agricultural training in the country schools. Social utilization is the aim of all the training. Further stipulations are for medical examinations twice yearly, and for both a medical and a scholastic record of the progress of each pupil.

The commission discussed at length methods of differentiating institutional cases from special-class cases and of defining and classifying the subnormal generally. They adopted the definitions proposed by Binet and Simon—idiots being defectives without the use of language; imbeciles being defectives who speak, but do not read and write; the weak-minded (morons) being defectives who learn to read and write, but who show a retardation of two years if less than nine years old, or three years if over nine years old. The third type are those under consideration in the bulletin. For their detection the commission proposes a very careful examination along pedagogical, psychological and medical lines. Pedagogical retardation is to be ascertained by averaging the retardation exhibited in reading, spelling and arithmetic (as determined by prescribed tests), psychological retardation by the Binet-Simon tests (two years' retardation being symptomatic of abnormality). The medical examination is primarily for the detection of physical impairment that might be removed or ameliorated.

The fundamental principles of the training of special-class pupils are by no means so clear, thinks the commission, as those governing

the training of institutional cases. Special classes are still too recent. We have much to learn. Two types of pupil may be distinguished: the true mentally backward type exhibits arrest of mentality, but is affectionate, docile and suggestible; the second, the unstable type, exhibits abnormality of character, is unruly, turbulent, and even violent, reminding one in many respects of the behavior of a three-year-old child, yet showing little or no retardation under the Binet-Simon tests.

The teacher of the special class must, then, treat her pupils as individuals, for no two of them are alike. Lessons must appeal to movement, must deal with the concrete, must be of short duration, must advance by short steps, must present facts by as many different ways as possible. Details of every-day life must be taught for practical results, with lessons, for instance, upon furniture, fuel, illumination, clothing, means of transportation, the dwelling, etc.

Special exercises for training attention, memory, observation, judgment and other mental functions are described under the term "mental orthopedics," *e. g.*, stringing beads, tracing triangles, squeezing the dynamometer, taking and maintaining altitudes at command, recognizing objects by touch, tests of range of apprehension, etc. All manual work, similarly, is to be regarded as a means of psychophysical development, as well as a direct training for occupation.

The commission recommends the employment of record forms on which may be indicated for each pupil his salient tendencies and aptitudes, considered with reference to their practical bearing and gathered from the daily impressions of the teacher.

The bulletin closes with a transcript of the laws and regulations governing the establishment and conduct of institutions for the education of backward children. As this review indicates, the pamphlet contains much of interest to those who are working with mental defectives in the public schools of this country. Supervisors of special classes would do well to read the entire bulletin.

ANNA E. BERRY.

Cornell University.

WILLIAM BOYD. *The Educational Theory of Jean Jacques Rousseau.* New York: Longmans, Green & Co. Pp. xiv, 368.

This work affords us a much more complete analysis and exposition of Rousseau's system of educational theory than has appeared hitherto in English. It is an account not merely of the system in its final form, but of its development, and is based upon an exhaustive study

of Rousseau's minor writings, as well as of *Émile, The New Helöise* and *The Social Contract.*

The book is admirably planned. Each of the successive stages of Rousseau's career is treated separately. His experiences and the conditions amidst which he lived during each of these periods, respectively, are described, especial attention being given to such as would tend to influence his educational views. Accompanying or immediately following the sketch of each stage of Rousseau's career is an account of the development of his views during that period. The merits of such a plan manifest themselves in the aid which the book affords the reader in acquiring a grasp of Rousseau's views as a whole and in accounting for the exaggerations, inconsistencies and contradictions which characterize his educational writings. After sketching the shiftless and erratic boyhood and youth of Rousseau, the experiences of which constitute that "sound and reasonable education" of which he boasted and which served to so great an extent as a model for the system of education outlined in *Émile,* the author gives some attention to his experience as tutor in the household of M. Mably and to the earliest of his educational writings, the *Projet pour l'Éducation de M. de Sainte-Marie,* which was written at this time. Notwithstanding the lack of originality of this little work, Mr. Boyd is inclined to emphasize its importance in determining Rousseau's attitude toward education. Its composition entailed manifestly a careful study of Locke, and it is to an attempt to remedy some of the defects of the English philosopher's system of education that we owe some of the doctrines characteristic of the *Émile.* "If there had been no *Projet,*" Mr. Boyd believes, "in all likelihood there would have been no *Émile.*"

Chapters III and IV are devoted to the discussion of the discourses *On the Sciences and Arts* and *On Equality.* It is in the cruder thought of these discourses that Rousseau develops the idea of the opposition of nature and society, the persistence of which in a later and more mature system of thought gives rise to some of the inconsistencies to be found in the *Émile.*

The remaining chapters are devoted to the elucidation of Rousseau's system of educational doctrine as set forth mainly in the *Émile,* but to some extent also in *The New Helöise, The Social Contract* and in later writings. The chapter entitled "The Preparation for Émile" is in effect a convincing rebuttal of the charge that Rousseau wrote on education as a mere doctrinaire. Chapter VI is an

MICHIGAN STATE NORMAL COLLEGE
TRAINING SCHOOL DEPARTMENT.

illuminating discussion of the development of Rousseau's views as to the relation between the state of nature and the social state.

In the following chapter attention is directed to an aspect of Rousseau's educational thought which has been somewhat neglected. An ideal system of education, Rousseau believed, would be one leading to the attainment of the highest good both for the individual and for the social whole. Such an ideal is attainable, however, only through the complete reorganization of society. Such reorganization being impracticable, Rousseau finds himself restricted in his educational aims to a choice between the good of the individual and the common good, between the education of the man and of the citizen. It matters little in Rousseau's opinion which of these aims is selected. The *Émile*, so generally accepted as a complete account of Rousseu's system of educational theory, contains in reality only his plan for the attainment of the former of these two ends. Mr. Boyd's book performs an important service in drawing attention to the other aspects of Rousseau's educational thought as set forth in his article on political economy and in his *Considerations on the Government of Poland*, where the end sought is the common good rather than the good of the individual. Those whose knowledge of Rousseau's educational doctrine is based solely upon the reading of *Émile* will be surprised to learn that he defines the virtuous man as one whose will is in conformity with the general will in all respects, and that he recommends that children be trained "never to regard their own existence as having any meaning apart from that of the State." It is suggestive that, in spite of Rousseau's denial of the possibility of such a result, the system devised for the attainment of one aim is found to contribute largely to the attainment of the other also.

Chapter VIII is devoted to the discussion of Rousseau's writings subsequent to the publication of *Émile*. The book closes with a critical estimate of Rousseau's permanent contribution to educational thought.

The broad basis which Mr. Boyd has laid for his work and his evolutionary method of treatment explain possibly the eminently judicious attitude he maintains toward his author.

It is unfortunate that the writer has found it necessary to make all his references to a German translation of *Émile* rather than to one of the standard French or English editions.

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EDITORIALS.

SENSORY TRAINING.

Which is of first importance to the child—the receiving of information or the development of the psychophysical organism? Most statements of educational aims emphasize the latter, but the prevailing practice is based upon the former alternative. Why? It is so easy; those who do not know how to teach are often natural experts in imparting information. It is so satisfying; the lecturer, from the kindergarten teacher to the university professor, can cast the statement of fact in such a lucid and artistic form that he is set all aglow with self-appreciation. The pupils approve of it; the ready-made goods seem attractive, and it is so comfortable to be free from effort and have things done for one.

Conversely, the efficient training of the psychophysical organism is very difficult. Take the matter of training the senses. To what extent has educational psychology actually modified practice on this point? Very little. Theoretically, educational psychology has furnished an approach to the pedagogy of sense training by giving in-

sight into the nature and function of sensory experience, showing that it involves only two elementary factors, namely, sensitivity and discrimination; that these are analogous in all the senses; that, aside from normality in the structure of the sense organ, the determining factor in both sensitivity and discrimination is central, a common factor for all the senses; that by right habits of attention the efficient keenness of the senses may be increased manifold above the now prevailing average; that these habits, once established, tend to perpetuate themselves and are an inestimable asset of power; that as a result of high efficiency in the power of sensory acquisition the information which is vital to life will come by the way; and that keen perception, the foundation of intelligence, is a condition for true and vital imagery, faithful memory, clear perception, incisive reasoning and efficient action.

Mere information does not lead to self-mastery; no amount of information stored up in early years can be a substitute for the mastery of the senses, for they are the windows of the soul, and if they are open and bright the rays from without will fill the soul and give it a warmth and vigor which will result in a trenchant growth from within. Our goal is not an information-stocked individual, but an individual of developed powers. Sporadic movements are made from time to time in recognition of this apparently trite principle, but it is so easy to fall back, so difficult to forge ahead consistently.

C. E. S.

THE NORMAL AND THE SUBNORMAL CHILD.

It is interesting to note that in the minds of many people a conviction seems to be gaining ground that the subnormal child has of late received more than his share of attention. The net results of the work in special classes and special schools for the feeble-minded are somewhat discouraging. In spite of the most costly equipment in workshops, small classes and specially trained teachers, it is acknowledged that little can be accomplished in the education of those who are handicapped by lack of mental endowment. The most that can be done is to render them in some measure self-supporting. Perhaps the ultimate solution of their problem will be to treat them as wards of the state. Meanwhile, the normal child is the future torch-bearer of our civilization. Is his education receiving the careful, individualized study which his capacity for improvement warrants? Admittedly it has not in the past. The study of the subnormal will have justified its expenditure of means and energy however, if it leads us to realize more clearly our obligation to the normal child.

J. C. B.

NOTES AND NEWS.

The new home schools for boys, of the type originated in England by Dr. Cecil Reddie at Abbottsholme almost a quarter of a century ago, have multiplied and become very popular, both in this country and abroad. Particularly in France has the movement met with a favorable reception; many schools have been founded (among the most noteworthy is L'École des Roches), and a flourishing journal, *L'Éducation,* is devoted to their interests. It is now proposed to establish an international bureau of "new schools" in connection with the Jean-Jacques Rousseau Institute, at Geneva—a bureau whose function it will be to collect and disseminate scientific information in regard to the work and the accomplishments of these schools. It is hoped that in this way the results of these "practical experiments in education" will be made more generally accessible to the entire educational world.

The National Association of Audubon Societies announces that it has $15,000 at its disposal to aid teachers and pupils in furthering bird study in the schools. Teachers who apply will receive, without expense to them, a number of publications on bird study, and pupils will be furnished with colored pictures, leaflets, etc., in return for a small enrollment fee. Teachers and pupils interested in nature study should write to Mr. T. Gilbert Pearson, secretary National Association of Audubon Societies, 1974 Broadway, New York City.

The First International Eugenics Congress, held at the Imperial Institute (University of London) July 24-30, 1912, was a distinct success, both from the point of view of attendance and of the papers presented. The congress was held at the call of the Eugenics Education Society of England, the first distinct organization for the definite purpose of advancing the eugenics propaganda, and the social and political prominence of those who appeared on the program was an indication of the widespread interest which has been aroused. Most of the papers were of a practical and popular nature, designed to stimulate and answer inquiry. Prof. F. S. C. Schiller, in a paper on "Practicable Eugenics in Education," gave a searching analysis of present educational conditions in England considered from the point of view of eugenics.

The Third Annual Meeting of the American Association for Study and Prevention of Infant Mortality was held in Cleveland October 2-5, 1912. The topics for the various conferences were Birth Registration, Continuation Schools of Home Making, Eugenics, Housing, Midwifery, Nursing and Social Work, and Progress in Preventive Work. The program for the eugenics conference included "The Significance of Heredity," Dr. Alfred G. Mayer; "Eugenics and Mental Variations," Roswell H. Johnson; "Mental Deficiency," H. H. Goddard; "The Proper Attitude of the Medical Profession Toward Eugenics;" "The Proper Attitude of the Church and Charitable Institutions Toward Eugenics;" "The Euthenical and Eugenical Aspects of Infant and Child Orthogenesis," J. E. Wallace Wallin.

The Third Annual Conference on the Problem of the Exceptional Child was held at the College of the City of New York October 30 and 31. The general topic of the conference was "The Differentiation Between the Difficult and Backward Child and the Feeble-minded Child." Emphasis was laid upon a recognition of the educational and social rights of the handicapped normal child, and there was a note of protest against the undue attention now commonly paid to the feeble-minded and the degenerate.

The Texas State Conference on Religious Education was held at Austin, October 25-26, 1912. The theme of the conference was "Religious Education in the Schools of Texas," and the discussions were participated in by representatives from the leading colleges, normal schools and city school systems of Texas.

The Second Annual Meeting of the National Council of Teachers of English will be held in Chicago November 28, 1912. Among the topics to be discussed are "Types of Organization of High-School English," "Books for Voluntary Reading," "Dramatic Work," "Oral Composition in College," "Relation of Grammar and Composition," and "Required English Courses in Normal Schools." Action will be taken with regard to a national syllabus and with regard to measures for relieving teachers who are overburdened with written work.

The University Elementary School of the University of Missouri has just moved into a new building specially constructed to meet the peculiar needs of the school. This interesting experiment in school organization has now been carried on for seven years under the direction of the superintendent, Prof. J. L. Meriam, and is meeting with marked success. The traditional course of study is entirely ignored, and the attempt has been made "to organize a course of study more suited to the interests, the needs, the abilities of individual pupils, and more in harmony with present social and industrial life." Thus the industrial and social activities of man become the core of the

work, and the traditional studies are used as means to become conversant with these activities.

Frank Mitchell Leavitt, associate professor of industrial education in the University of Chicago, was one of the speakers at the conference called in Springfield by the Illinois Bankers' Association for August 14 to discuss a proposed state law making provision for "practical" studies in all state schools. The proposed courses are in agriculture, domestic science and industrial education. Professor Leavitt was made a member of the committee to draft the bill, other members being Francis G. Blair, State Superintendent of Public Instruction of Illinois, and Edwin G. Cooley, former superintendent of the Chicago schools. Prof. George H. Mead of the Department of Philosophy in the University of Chicago, who is chairman of the committee on education in the Chicago City Club, was also a member of the conference.

On Tuesday, October 15, Prof. Hugo De Vries addressed the students and faculty of the University of Texas on the subject of "Darwinism in the Light of Recent Experiments."

Prof. Williston S. Hough, dean of the Teachers College and professor of philosophy at the George Washington University, Washington, D. C., died of an ulcer of the stomach September 18 after an illness of three days.

Dr. I. Madison Bentley, assistant professor of psychology in Cornell University, has been appointed professor of psychology and head of the department of psychology in the University of Illinois. Dr. H. P. Weld of Clark University succeeds Dr. Bentley at Cornell.

Dr. W. F. Book, professor of psychology and philosophy at the University of Montana and for the past two years instructor in the Summer School of Columbia University, has accepted a professorship of educational psychology at Indiana University.

CURRENT PERIODICALS.

(In this section only such articles will be noticed as bear directly or indirectly upon the interests of this journal.)

ZEITSCHRIFT FUER PAEDAGOGISCHE PSYCHOLOGIE UND EXPERIMENTELLE PAEDAGOGIK. Vol. XII, 1911. EDUARD CLAPARÈDE. *The Significance of Animal Psychology for Pedagogy.* 145-156. Animals in training and children receiving instruction manifest certain similarities in mental traits and respond in similar ways to training in imitation. The study of animal psychology throws much light on pedagogy.

A. HUTHER. *The Psychology of Foreign Language Translations.* 156-164. To regard the sentence as a compound of subject and predicate is better than to treat it as a unit, because such division tends to clarify the thought.

ALOYS FISCHER. *Vocational Education and General Education.* 165-175. Illustrating by the development and successful operation of certain schools in Denmark, the writer advocates that vocational education should follow and supplement a thorough general education; the individual and accessory should proceed from the general.

E. MEUMANN. *The Present Status of Pedagogy.* 193-206. Modern pedagogy arose in the study of the psychology of childhood, and has developed through its relations with systematic philosophy and the social sciences; its social phases now occupy the center of attention.

MICHAEL KESSELRING. *Experimental Research on the Theory of Lesson Plans.* 314-324. The results favor longer and less frequent class meetings, which, with advancing grades, may be farther apart.

H. SAEDLER. *The Influence of Opportunity for Festal Experiences Upon the Thought Activity of the Pupils.* 324-333; 390-403. Participation in festal occasions increases mental content and enriches thought activity.

KARL GROOS. *Play as Catharsis.* 353-367. The Catharsis theory is closely related to the "surplus energy" theory. Play generally clarifies the mind, purifies the emotions, removes depression, overcomes harmful tendencies, develops good traits and renders the spiritual life more wholesome.

HEINRICH STADELMANN. *Mental Degeneracy.* 507-520. The article is concerned with tests, evidences and results of degeneracy, and includes examples. Dissociation is the underlying cause.

H. KEMSIES. *Pupils' Offenses and School Punishment According to Statistics.* 520-530; 574-578; 597-621. Most offenses are minor and lightly punished, and nearly all serious ones are committed by a small number of individuals.

———. *The Industrial School as the Reform School.* 545-552. The industrial school in its present form cannot supply the exact reform now needed, though the introduction of some of its phases would raise the standard of the German schools. Spontaneity, inventiveness and individuality are lacking. Personality is the all-

important factor in all phases of life, and the school should assist in its development.

OTTO SCHEIBNER. *The First German Congress on the Education and the Knowledge of Youth.* 553-574. The autumn session of the Association for School Reform was held in Dresden, October 6th-8th, 1911. "The Industrial School" and "The Problem of Intelligence and the School" were the fundamental problems discussed by the many prominent and representative educators in attendance.

REVUE PSYCHOLOGIQUE. Vol. IV, No. 1, March, 1912.

I. IOTEYKO. *How One Remembers Figures, Syllables, Words and Pictures.* 1-20. An experimental study of the memory processes of eleven subjects, including the mathematical prodigy, Mlle. Diamandi. The material was all presented visually, but in the reproduction most of the subjects made use of auditory, motor and other imagery in addition to the visual. There was a constant effort to establish meaningful connections between the parts of the material.

I. IOTEYKO. *The Life of Psychic Elements.* 20-45. In this interesting series of three short articles the author endeavors to picture mental life as a biological phenomenon. There is a continuous struggle for existence among the mental responses to the countless stimuli by which we are assailed. The laws of forgetting are only generalizations upon the destruction of the unfit elements of experience, and here, as elsewhere in nature, the mortality is frightfully large. The third article deals with the evolution and dissolution of the mental image.

M. STEFANOWSKA. *The Child, Nature and the Teaching of the Natural Sciences.* 45-51. Current European methods of teaching natural science are arraigned as stiff, formal and contrary to the natural interests and capacities of the child.

O. BUYSE. *The Psycho-physical Problems of Apprenticeship.* 51-55. A valuable survey of important problems in industrial training which call for solution by experimental methods. What are the psycho-physical characteristics that make for success in each of the principal trades? What is the amount of energy required and the degree of fatigue engendered by a unit amount of work in each of the more strenuous trades? What is the nature and rate of the acquisition of skill in each trade? These are instances of the many questions raised.

I. IOTEYKO. *Report on the Sentiment of Justice.* 55-69. A statistical study of the results of a questionnaire investigation in two Belgian normal schools. A great majority of the cases of injustice were referable to social causes. School conditions came next, while home conditions gave practically no occasion for the feeling of injustice.

V. KIPIANI. *Bulletin of the Free Society for the Psychological Study of the Child, Paris, 1900-1910.* 99-120. A valuable digest of the publications of the society presided over for so many years by M. Alfred Binet.

PUBLICATIONS RECEIVED TO OCTOBER 1, 1912.

ALFRED BINET AND TH. SIMON. *A Method of Measuring the Development of the Intelligence of Young Children.* Authorized translation by Clara Harrison Town, Ph.D. Lincoln, Ill.: The Courier Company, 1912. Pp. 83. $1.

In view of the widely-extended and growing interest in the Binet and other tests of intelligence, Dr. Town has rendered a genuine service to English readers in making accessible to them the final form of the Binet scale and the directions for its application. The monograph is translated from the April, 1911, number of the *"Bulletin de la Société libre pour l'Etude psychologique de l'Enfant,"* and gives a simple, straightforward description of the tests without distracting theoretical discussion. It should be in the hands of everyone who attempts to use the tests.

SOPHONISBA P. BRECKINRIDGE, Editor. *The Child in the City.* Chicago: The Chicago School of Civics and Philanthropy, 1912. Pp. xiii, 502.

This volume is a collection of the papers read at the conferences of the Chicago Child Welfare Exhibit, May 11-25, 1911, and aims to present "the unsatisfied claims of childhood upon the modern community." The papers are grouped in nine parts under the following headings: I, Personal Service; II, Physical Care; III, The School and the Child; IV, Special Groups of Children; V, The Working Child; VI, The Law and the Child; VII, Libraries and Museums; VIII, Social and Civic Problems of Childhood; IX, The Uncompleted Task.

SOPHONISBA P. BRECKINRIDGE AND EDITH ABBOTT. *The Delinquent Child and the Home.* New York: Charities Publication Committee, 1912. Pp. x, 355. $2.

This important contribution to the study of the delinquent child is the result of an inquiry into the work of the Juvenile Court of Cook County, Illinois, and deals with the first 10 years (1899-1909) of that institution's history. The book is thus based on the study of over 14,000 children, and attempts to determine the causes of delinquency, to contribute to a better understanding of the needs of all children, and to point out lines of development for juvenile court procedure. We consider it an extremely valuable and authoritative work which will be of great help in clarifying our ideas on moral education. Many of the voluminous discussions of moral education have been too theoretical and too far removed from the facts. We need to study

more carefully the by-products of our great social laboratory of morals, in order that we may avoid the waste which undoubtedly characterizes our present procedure. The Russell Sage Foundation is to be congratulated on having added this number to its excellent series of social studies.

STRATTON D. BROOKS. *English Composition. Book Two.* New York: American Book Co., 1912. Pp. 432. $1.

"The aim of this book is not merely to develop skill in expressing thought with clearness, ease and force, but also to lead the pupil to draw from his inner consciousness ideas of which he is but dimly aware, and to find in his own experience the richest store of material for composition."

Current Educational Topics, No. II. Abstracts of Papers Presented at St. Louis, Mo., February 26-29, 1912. Prepared by Frederick K. Noyes. Bulletin 487. Washington: Bureau of Education, 1912. Pp. 115.

HENRY S. CURTIS. *The Reorganized School Playground.* Bulletin 488. Washington: Bureau of Education, 1912. Pp. 23.

An admirable discussion of the location, surfacing, maintenance, equipment and management of school yards.

J. A. DELL, M.Sc. *The Gateways of Knowledge. An Introduction to the Study of the Senses.* Cambridge: The University Press. New York: G. P. Putnam's Sons, 1912. Pp. xii, 171.

In the evaluation of the numerous and varied subjects now offered or proposed in our secondary school courses of study the ultimate criterion must be, "What subjects will, in the long run, prove of greatest value to the pupil?" From this point of view it is difficult to see what could be of greater permanent value to the average citizen than a knowledge of himself and of his relations to things about him, and to this end physiology and psychology would be the largest contributors. Physiology is just beginning to find its place in the high-school curriculum, while psychology is generally excluded. In the few places where an attempt has been made to teach psychology in the high school the subject has been presented in such an involved and philosophical manner as to justify the criticism that high-school pupils are not sufficiently mature for that sort of thing. Yet there is no subject in which the adolescent pupil is more keenly interested than in the way in which he becomes aware of things, remembers, feels, thinks and acts. Mr. Dell has written a simple, experimental psychology for upper grammar-school and high-school students from 12 to 15 years of age. Eighty-nine exercises are proposed, covering the whole field of sensory experience. The necessary apparatus is

such as could be furnished by the pupils themselves. In the hands of a live teacher this book could be made the basis of one of the most interesting and stimulating courses that could be offered to high-school students.

JOHN WIRT DINSMORE. *The Training of Children. A Book for Young Teachers.* New York: The American Book Co., 1912. Pp. 336. $1.

It is difficult to find any rational justification for this book. Purporting to present the essential facts and underlying truths of psychology to young and inexperienced teachers who have had no advanced training, the book abounds in empty platitudes and the vague generalizations of an antiquated faculty psychology. If the author knows anything of the progress of psychological studies during the past 25 years, he has succeeded admirably in concealing this knowledge from his readers.

ARTHUR MACDONALD. *Mentality of Nations in Connection with Patho-social Conditions.* Reprinted from The Open Court, 26: No. 8, August, 1912. Pp. 449-460.

"The general purpose of this article is a comparison between States of the Union and of different countries as to education and diffusion of knowledge, and to determine what relation, if any, intellectual conditions may have to patho-social and other conditions in those countries."

ALBERT MOLL. *The Sexual Life of the Child.* Translated from the German by Eden Paul. New York: The Macmillan Company, 1912. Pp. xv, 339. $1.75.

This is, perhaps, the most important book that has yet appeared on the pathological aspects of the sexual life of the child. It is strictly scientific in its treatment, and presents an unvarnished picture of some disagreeable phases of developing human nature. It is a book for the specialist rather than for the average teacher.

M. V. O'SHEA. *Every-day Problems in Teaching.* Indianapolis: The Bobbs-Merrill Company, 1912. Pp. xli, 388.

This book deals not with problems for experimental investigation, but rather with the elements of success or failure in teaching. It presents a series of concrete examples of effective teaching, or the reverse. Among the topics considered are questions of government and discipline, teaching pupils to think and execute, the tendencies of novices in teaching, and the education of girls. The work represents the fruit of wide and carefully-weighed experience, and will be of great help to the young teacher.

BENJAMIN RAND. *The Classical Psychologists. Selections Illustrating Psychology from Anaxagoras to Wundt.* Boston: Houghton-Mifflin Company, 1912. Pp. xxi, 734. $3.50.

A very useful source book for a course in the development of psychological thinking. One hundred and fifteen pages are devoted to the ancients, chiefly Greek; 30 pages to the four medieval writers, Tertullian, Gregory of Nyssa, Saint Augustine and Thomas Aquinas, and the remainder of the book, almost 600 pages, is given up to the moderns. The representatives of this group are chosen from a broad field, and the selection gives evidence of a catholic taste. The list includes Hobbes, Descartes, Spinoza, Leibnitz, Wolff, Locke, Berkeley, Hume, Hartley, Bonnet, Condillac, Reid, Brown, Herbert, Beneke, Drobisch, Maine de Biran, James Mill, Bain, Spencer, Johannes Mueller, Lotze, Weber, Fechner, Helmholtz, Hering, Mach, Stumpf, James, Lange and Wundt. Many of the translations were made especially for this volume by Dr. Rand. In each instance it has been the endeavor to select passages which are characteristic of the author's point of view and which have most profoundly influenced the trend of psychological development.

Report of the American Commissioners of the International Commission on the Teaching of Mathematics. Bulletin 486. Washington: Bureau of Education, 1912. Pp. 84.

The reports of the special committees and subcommittees have already appeared in previous Bulletins and have been noticed in these columns. This Bulletin contains the general introduction to and summary of the investigation, and the index for the whole series of reports.

Report of the Commissioner of Education for the Year Ended June 30, 1911. *Volume I.* Whole number 478. Washington: Bureau of Education, 1912. Pp. xviii, 676. *Volume II.* Whole number 479. Washington: Bureau of Education, 1912. Pp. xliii, 677-1407.

Report of the Committee on Uniform Records and Reports Adopted by the Department of Superintendence of the National Education Association. Bulletin 471. Washington: Bureau of Education, 1912. Pp. 46.

Social Research Council of Boston. Bulletin No. 1. *A Preliminary List of Recent Social Investigations in Greater Boston.* Cambridge, Mass.: Printed for the Council, 1912. Pp. 42.

A valuable list for the student and social worker.